

**SYSTEMS AND METHODS FOR SEGMENTING AND DISPLAYING
TUBULAR VESSELS IN VOLUMETRIC IMAGING DATA**

ABSTRACT

5 This document discusses, among other things, systems and methods for segmenting and displaying blood vessels or other tubular structures in volumetric imaging data. The vessel of interest is specified by user input, such as by using a single point-and-click of a mouse or using a menu to select the desired vessel. A central vessel axis (CVA) or centerline path is obtained. A segmentation algorithm
10 uses the centerline to propagate a front that collects voxels associated with the vessel. Re-initialization of the algorithm permits control parameter(s) to be adjusted to accommodate local variations at different parts of the vessel. Termination of the front occurs, among other things, upon vessel departure, for example, indicated by a speed of front evolution falling below a predetermined threshold. After
15 segmentation, an analysis view displays on a screen a 3D rendering of an organ or region, along with orthogonal lateral views of the vessel of interest, and cross-sectional views taken perpendicular to the centerline, which has been corrected using the segmented volumetric vessel data. Cross-sectional diameters are measured automatically, or using a computer-assisted ruler, to permit assessment of
20 stenosis and/or aneurysms. The segmented vessel may also be displayed with a color-coding to indicate its diameter.